

Claims

1. A method of producing a flame-retardant translucent laminate, the method comprising :
 - 5 (i) providing a radiation curable composition comprising at least one radiation curable polymer precursor having polymerizable ethylenically unsaturated functions (component I) and an optional additive (component II), at least one of the components providing flame retardant properties to the cured composition,
 - (ii) curing the polymer precursor preferably by irradiating the composition and
 - 10 (iii) forming a layer which layer comprises the cured composition and bonds at least two glass panes so as to form a flame-retardant translucent laminate.
2. A method of producing a flame-retardant translucent laminate according to claim 1, wherein the radiation curable polymer precursor provides flame retardant properties to the cured composition ("flame retardant polymer precursor").
- 15 3. A method of producing a flame-retardant translucent laminate according to claim 2, wherein the flame retardant polymer precursor comprises one or more radiation curable halogen or phosphorus containing (or combination of both) polymer precursor which have, at the chains ends or laterally along the chain, acrylic, methacrylic or vinyl groups.
- 20 4. A method of producing a flame-retardant translucent laminate according to claim 3, wherein the flame retardant polymer precursor comprises at least one of: phosphorus containing urethane acrylate or methacrylate, phosphorus containing polyester acrylate or methacrylate, phosphorus containing epoxy, acrylate or methacrylate.
- 25 5. A method of producing a flame-retardant translucent laminate according to any preceding claim, wherein the composition contains one or more radiation curable monomer which is an halogen or phosphorus containing (or combination of both) reactive monomer which contributes flame retardant properties of the cured composition ("flame retardant monomer").
- 30 6. A method of producing a flame-retardant translucent laminate according to claim 5, wherein the flame retardant monomer comprises pentabromobenzylacrylate, the reaction product of glycidyl methacrylate with dialkylphosphate, and/or the reaction product of glycidyl methacrylate with dialkylphosphate and boric acid.
7. A method of producing a flame-retardant translucent laminate according to any preceding claim, wherein the composition contains one or more monoethylenically or polyethylenically unsaturated monomers ("non flame retardant monomer").
- 35 8. A method of producing a flame retardant translucent laminate according to claim 7, wherein the non flame retardant monomer comprises at least one of the following: acrylic acid, methacrylic acid, beta-carboxyethyl acrylate, butylacrylate.

- butylmethacrylate, methylacrylate, methylmethacrylate, 2-ethylhexylacrylate, 2-ethylhexylmethacrylate, acrylic acid, methacrylic acid, octyl/decyl acrylate, octyl/decyl methacrylate, 2-hydroxyethylacrylate, 2-hydroxyethylmethacrylate, phenoxyethylacrylate, phenoxyethylmethacrylate, nonylphenoethoxylate
- 5 monoacrylate, nonylphenoethoxylate monomethacrylate, beta-carbonylethylacrylate, 2-(-2-ethoxyethoxy)ethylacrylate, 1,6-hexanediol diacrylate, pentaerythritoltriacylate (PETIA), trimethylolpropanetriacylate (TMPTA), acrylated or methacrylated oxyethylated or/and oxypropylated derivatives.
8. A method of producing a flame retardant translucent laminate according to any
- 10 preceding claim, wherein the composition comprises an additive which is a not copolymerizable, non reactive, organic or inorganic compound contributing to the flame-retardant properties of the cured composition ("flame retardant additive").
9. A method of producing a flame retardant light-transmitting laminate according to
- 15 claim 9, wherein an intumescent agent and/or nanoparticles are used as flame retardant additive.
10. A method of producing a flame retardant laminate according to any preceding claim, wherein the composition comprises nanoparticles functionalized with acrylate and/or methacrylate functions.
11. A flame-retardant light-transmitting laminate obtainable by a method according to
- 20 any preceding claim.
12. Radiation curable composition comprising:
- (i) at least one radiation curable polymer precursor providing flame retardant properties to the cured composition ("flame retardant polymer precursor"), which polymer precursor comprises one or more radiation polymerizable,
- 25 halogen or phosphorus containing (or combination of both) polymer precursor which have, at the chains ends or laterally along the chain, acrylic, methacrylic or vinyl groups, and
- (ii) at least one of the following compounds:
- (ii1) a radiation curable monomer which is a monoethylenically or
- 30 polyethylenically unsaturated monomer ("non flame retardant monomer") and/or
- (ii2) a radiation curable monomer which is an halogen or phosphorus containing (or combination of both) reactive monomer which contributes to flame retardant properties of the cured composition ("flame retardant
- 35 monomer").
13. Radiation curable composition according to claim 13, wherein the flame retardant polymer precursor comprises at least one of: phosphorus containing urethane acrylate or methacrylate, phosphorus containing polyester acrylate or

methacrylate, water-thinnable phosphorous-containing polyesteracrylate or methacrylate.

14. Radiation curable composition according to claim 13 or 14, wherein the non flame retardant monomer comprises at least one of the following: acrylic acid, methacrylic acid, beta-carboxyethyl acrylate, butylacrylate, butylmethacrylate, methylacrylate, methylmethacrylate, 2-ethylhexylacrylate, 2-ethylhexylmethacrylate, acrylic acid, methacrylic acid, octyl/decyl acrylate, octyl/decyl methacrylate, 2-hydroxyethylacrylate, 2-hydroxyethylmethacrylate, phenoxyethylacrylate, phenoxyethylmethacrylate, nonylphenoethoxylate monoacrylate, nonylphenoethoxylate monomethacrylate, beta-carbonylethylacrylate, 2-(2-ethoxyethoxy)ethylacrylate, 1,6-hexanediol diacrylate pentaerythritoltriacylate (PETIA), trimethylolpropanetriacylate (TMPTA), acrylated or methacrylated oxyethylated or/and oxypropylated derivatives.
15. Radiation curable composition according to any of claims 13 to 15, wherein the flame retardant polymer precursor comprises at least one of: phosphorus containing urethane acrylate or methacrylate, phosphorus containing polyester acrylate or methacrylate, phosphorus containing epoxy acrylate or methacrylate.
16. Radiation curable composition according to any of claims 13 to 16, wherein the flame retardant polymer precursor comprises 9,10-dihydro-9-oxa-10-phosphaphenanthrene-10-oxide.
17. Radiation curable composition according to any of claims 13 to 17, wherein the flame retardant monomer comprises at least one of: pentabromobenzylacrylate, the reaction product of glycidyl methacrylate with dialkylphosphate, the reaction product of glycidyl methacrylate with dialkylphosphate and boric acid.
18. Radiation curable composition according to any of claims 13 to 18 wherein the composition is translucent.
19. Composition obtainable by radiation curing of the composition claimed in any of claims 13 to 18.
20. Composition according to claim 20, which is translucent.